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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/626,024 | 07/24/2003 | Tetsuo Tsutsui | 0553-0373 | 9956 |

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EXAMINER

SANTIAGO, MARICELI

ART UNIT PAPER NUMBER

2879

DATE MAILED: 09/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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| | | | |
|------------------------------|--------------------------------------|--|--|
| Office Action Summary | Application No. 10/626,024 | Applicant(s) TSUTSUI, TETSUO | |
| | Examiner Mariceli Santiago | Art Unit 2879 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213:

Disposition of Claims

- 4) ☒ Claim(s) 1,4-9 and 14-44 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-44 is/are allowed.
- 6) ☒ Claim(s) 1,4-9 and 14-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some * c) ☐ None of:
 - 1. ☒ Certified copies of the priority documents have been received.
 - 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Amendment, filed on June 21, 2005, has been entered and acknowledged by the Examiner.

Cancellation of claims 2-3 and 10-13 has been entered.

Claims 1, 4-9 and 14-44 are pending in the instant application.

Upon further consideration, the indicated allowability of subject matter claimed in claims 2 and 3 is withdrawn in view of the newly discovered reference to Furukawa et al. (JP 11162646). Rejections based on the newly cited reference follow.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 7, 14, 15, 19, 22, 23, 27 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okai et al. (JP 2002-033193) in view of Furukawa et al. (JP 11162646).

Regarding claims 1 and 15, Okai discloses an organic electroluminescent device comprising a first electrode (111), a second electrode (112), and an electroluminescent layer (101), the electroluminescent layer containing an organic compound that emits light by an application of a voltage, wherein conductive particles are dispersed in the electroluminescent layer (carbon nanotubes, Paragraphs [0005-0006]). Okai fails to teach the limitations of a first insulating layer between the first electrode and the electroluminescent layer, and a second

insulating layer between the second electrode and the electroluminescent layer. However, in the same field of endeavor, Furukawa discloses an organic electroluminescent device comprising a first electrode (2), a second electrode (7), and an electroluminescent layer (4, 5), a first insulating layer (3) between the first electrode (2) and the electroluminescent layer (4, 5), and a second insulating layer (6) between the second electrode (7) and the electroluminescent layer (4, 5), with such configuration light is emitted at low voltage and the luminous efficiency is also good, electrical leakage is suppressed, and since continuous light emission is carried out, there is no reduction in the brightness and light emission is stable for longer period of time. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the insulating layers disclosed by Furukawa in the organic electroluminescent device of Okai in order to emit light at low voltage with good luminous efficiency, suppress electrical leakage, and provide continuous light emission without a reduction of brightness and have light emission stability for a longer period of time.

In regards to the limitation “for preventing a carrier injection from the first electrode to the electroluminescent layer” and “for preventing a carrier injection from the second electrode to the electroluminescent layer” stated in claim 15, the recitation are considered an intended used recitation. It has been held that a recitation with respect to the manner in which a claimed element is intended to be employed does not differentiate the claimed element from a prior art structure satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ 2d 1647 (1987). Furukawa discloses insulating layers selected from materials that are know for their charge blocking capabilities (Paragraph [0012]), accordingly it is considered that the dielectric materials taught by Furukawa satisfy the claimed structural limitations.

Although Okai-Furukawa are silent in regards to the limitation “wherein the organic electroluminescent device is operated by an alternating current bias” as stated in claim 23, one

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skilled in the art would be reasonable apprised as to the AC or DC driving capabilities of organic EL displays, accordingly absent showing any unexpected results that are not within the scope of the teaching applied, application of an AC driving operation is considered as an obvious matter of design engineering. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to operate the organic EL device by an alternating current bias, since such modification is considered as an obvious matter of design engineering.

Regarding claims 7, 19 and 27, Okai discloses an organic electroluminescent device wherein the conductive particles contain a material having conductivity equal to or greater than 10^{-10} S/m (the material used for the conductive particles inherently have the claimed conductivity).

Regarding claims 14, 22 and 30, Okai discloses an organic electroluminescent device wherein the conductive particles comprise at least one selected from the group consisting of carbon particles, carbon particles that have undergone a surface treatment by use of a surfactant, carbon nanotubes, and fullerenes (carbon nanotubes, Paragraphs [0005-0006]).

Claims 1, 4-9, 15-21 and 23-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marrocco, III et al. (US 2002/0028347) in view of Furukawa et al. (JP 11162646).

Regarding claims 1, 15 and 23, Marrocco discloses an organic electroluminescent device comprising a first electrode (12), a second electrode (20), and an electroluminescent layer (18) between the first electrode and the second electrode, the electroluminescent layer containing an organic compound that emits light by an application of a voltage, wherein conductive particles are dispersed in the electroluminescent layer (Paragraph [0032]). Marrocco fails to teach the limitations of a first insulating layer between the first electrode and the

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electroluminescent layer, and a second insulating layer between the second electrode and the electroluminescent layer. However, in the same field of endeavor, Furukawa discloses an organic electroluminescent device comprising a first electrode (2), a second electrode (7), and an electroluminescent layer (4, 5), a first insulating layer (3) between the first electrode (2) and the electroluminescent layer (4, 5), and a second insulating layer (6) between the second electrode (7) and the electroluminescent layer (4, 5), with such configuration light is emitted at low voltage and the luminous efficiency is also good, electrical leakage is suppressed, and since continuous light emission is carried out, there is no reduction in the brightness and light emission is stable for longer period of time. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to incorporate the insulating layers disclosed by Furukawa in the organic electroluminescent device of Marrocco in order to emit light at low voltage with good luminous efficiency, suppress electrical leakage, and provide continuous light emission without a reduction of brightness and have light emission stability for a longer period of time.

In regards to the limitation "for preventing a carrier injection from the first electrode to the electroluminescent layer" and "for preventing a carrier injection from the second electrode to the electroluminescent layer" stated in claim 15, the recitation are considered an intended used recitation. It has been held that a recitation with respect to the manner in which a claimed element is intended to be employed does not differentiate the claimed element from a prior art structure satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ 2d 1647 (1987). Furukawa discloses insulating layers selected from materials that are know for their charge blocking capabilities (Paragraph [0012]), accordingly it is considered that the dielectric materials taught by Furukawa satisfy the claimed structural limitations.

Although Marrocco-Furukawa are silent in regards to the limitation "wherein the organic electroluminescent device is operated by an alternating current bias" as stated in claim 23, one skilled in the art would be reasonable apprised as to the AC or DC driving capabilities of organic EL displays, accordingly absent showing any unexpected results that are not within the scope of the teaching applied, application of an AC driving operation is considered as an obvious matter of design engineering. Thus, it would have been obvious at the time the invention was made to a person having ordinary skills in the art to operate the organic EL device by an alternating current bias, since such modification is considered as an obvious matter of design engineering.

Regarding claims 4, 16 and 24, Marrocco discloses an organic electroluminescent device wherein the electroluminescent layer comprises a bipolar characteristics (Paragraphs [0063-0064]).

Regarding claims 5, 17 and 25, Marrocco discloses an organic electroluminescent device wherein the electroluminescent layer comprises a bipolar mixed layer in which an organic compound having an electron transporting characteristics and an organic compound having a hole transporting characteristics are mixed (Paragraphs [0063-0064]).

Regarding claims 6, 18 and 26, Marrocco discloses an organic electroluminescent device wherein the electroluminescent layer contains a polymeric compound having at least one of a π -conjugate system and a σ -conjugate system (Paragraph [0044]) and having bipolar characteristics (Paragraphs [0063-0064]).

Regarding claims 7, 19 and 27, Marrocco discloses an organic electroluminescent device wherein the conductive particles contain a material having a conductivity equal to or greater than 10^{-10} S/m (claim 17 discloses the material used for the conductive particles, such materials inherently have the claimed conductivity).

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Regarding claims 8, 20 and 28, Marrocco discloses an organic electroluminescent device wherein the conductive particles comprise metal particles having an average diameter between 2 and 50 nm (Paragraph [0032]).

Regarding claims 9, 21 and 29, Marrocco discloses an organic electroluminescent device wherein the metal particles comprise at least one selected from the group consisting of gold, silver, and platinum (claim 17).

Allowable Subject Matter

Claims 31-44 are allowed over the prior art of record.

The following is a statement of reasons for the indication of allowable subject matter:

Regarding claim 31, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 31, and specifically comprising the limitation of conductive particles are dispersed in the electroluminescent layer, and wherein the conductive particles are covered with an organic compound.

Regarding claims 32-38, claims 32-38 are allowable for the reasons given in claim 31 because of their dependency status from claim 31.

Regarding claim 39, the references of the Prior Art of record fails to teach or suggest the combination of the limitations as set forth in claim 39, and specifically comprising the limitation of semiconductor particles dispersed in the electroluminescent layer, and wherein the semiconductor particles are covered with an organic compound.

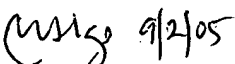
Regarding claims 40-44, claims 40-44 are allowable for the reasons given in claim 39 because of their dependency status from claim 39.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mariceli Santiago whose telephone number is (571) 272-2464. The examiner can normally be reached on Monday-Friday from 9:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel, can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Mariceli Santiago
Primary Examiner
Art Unit 2879